

Application number 10/635,561
Response to office action mailed Oct 03, 2006

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

We claim:

1. (Currently amended) A method for selective payload cancellation in an optical communication system (OCS), including an Intensity Modulator for selectively controlling the intensity of payload of the OCS, the method comprising steps of:
extracting and processing signal from an input of the Intensity Modulator;
extracting and processing signal from an output of the Intensity Modulator;
estimating amplitude and phase of a frequency band in a payload to be cancelled by a Digital Signal Processing and Control Unit (DSPCU);
producing output signals of said DSPCU using the extracted and processed signals from the input and the output of the Intensity Modulator, and the estimated amplitude and phase of the frequency band in the payload to be cancelled; and
generating a cancellation signal using the output signals produced by the DSPCU ~~and the extracted and processed signal from the input of the Intensity Modulator,~~ and canceling the frequency band in the payload to be cancelled.

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2. (original) A method as claimed in claim 1, wherein the step of extracting and processing signal from the input of the Intensity Modulator comprises the steps of:

tapping input payload signal at the input of the Intensity Modulator;
converting the tapped input payload signal into input electrical signal using an optical to electrical converter; and
processing said input electrical signal.

3. (original) A method as claimed in claim 1, wherein the step of extracting and processing signal from the output of the Intensity Modulator comprises the steps of:

tapping output payload signal at the output of the Intensity Modulator;
converting the tapped output payload signal into output electrical signal using an optical to electrical converter; and
processing said output electrical signal.

4. (original) A method as claimed in claim 1, wherein the step of estimating amplitude and phase of the frequency band in the payload to be cancelled comprises the steps of:

extracting the amplitudes and phases of spectral

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components of the frequency band in the payload to be cancelled using a DFT (Digital Fourier Transform) of the processed output electrical signal using an Amplitude and Phase Estimator within the DSFCU; and

computing an effective amplitude and phase for each spectral component of the frequency band in the payload to be cancelled by the DSFCU.

5. (original) A method as claimed in claim 1, wherein the step of producing the output signals of the DSFCU comprises the steps of:

generating a variable gain control signal by an Adaptive Variable Gain Control Unit in the DSFCU as a first output signal of the DSFCU;
generating a variable phase delay control signal by an Adaptive Phase Control Unit in the DSFCU as a second output signal of the DSFCU; and
generating a third output signal by the DSFCU for processing the output electrical signal.

6. (original) A method as claimed in claim 2, wherein the step of processing the input electrical signal comprising the steps of:

amplifying the input electrical signal in accordance with the first output signal produced by the DSFCU;
and

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filtering the amplified signal for extracting the frequency band in the payload to be cancelled by applying a high order linear band-pass filter.

7. (original) A method as claimed in claim 1, wherein the step of generating the cancellation signal and canceling the frequency band in the payload to be cancelled comprises the steps of:

phase matching the input payload signal at the Intensity Modulator and the cancellation signal applied to the Intensity Modulator by a Variable Phase Delay unit, using the second output signal produced by the DSPCU and the extracted and processed input signal; and applying the cancellation signal through a driver to the Intensity Modulator for selectively controlling the intensity of the payload and removing the frequency band to be canceled in the payload.

8. (original) A method as claimed in claim 3, wherein the step of processing the output electrical signal comprises the steps of:

amplifying the tapped output payload signal in accordance with the third output signal produced by the DSPCU;
filtering the amplified signal for extracting the frequency band in the payload to be cancelled by

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applying the high order linear band-pass filter; and

converting the filtered output from analog to digital by an Analog to Digital Converter (ADC) for the digital processing performed by the DSFCU.

9. (Currently amended) A system for selective payload cancellation in an optical communication system (OCS), including an Intensity Modulator for selectively controlling the intensity of payload of the OCS, the system comprising:

means for extracting and processing signal from an input of the Intensity Modulator;

means for extracting and processing signal from an output of the Intensity Modulator;

a Digital Signal Processing and Control Unit (DSFCU) for estimating amplitude and phase of a frequency band in a payload to be cancelled and for producing output signals using the extracted and processed signals from the input and the output of the

Intensity Modulator, and the estimated amplitude and phase of the frequency band in the payload to be cancelled;; and

means for generating a cancellation signal using the output signals produced by the DSFCU.—and the extracted and processed signal from the input of the Intensity Modulator.

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10. (original) A system as claimed in claim 9,
wherein the means for extracting and processing signals
at the input of the Intensity Modulator, comprises:
an input optical tap for tapping input payload
signal at the input of the Intensity Modulator;
an optical to electrical converter for converting
the tapped input payload signal into input
electrical signal; and
means for processing said input electrical signal.

11. (original) A system as claimed in claim 9,
wherein the means for extracting and processing signals
at the output of the Intensity Modulator, comprises:
an output optical tap for tapping output payload
signal at the output of the Intensity Modulator;
an optical to electrical converter for converting
the tapped output payload signal into output electrical
signal; and
means for processing said output electrical signal.

12. (original) A system as claimed in claim 9,
wherein the DSPCU comprises:
an Amplitude and Phase Estimator for estimating a
frequency band in the payload to be cancelled;
an Adaptive Variable Gain Control Unit for
generating a variable gain control signal as a first

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output signal of the DSPCU; and
an Adaptive Phase Delay Control Unit for generating
a phase delay control signal as a second output of
the DSPCU.

13. (original) A system as claimed in claim 12,
wherein the Amplitude and Phase Estimator comprises:
means for extracting the amplitudes and phases of
the spectral components of the frequency band in the payload
to be cancelled
using a DFT (Digital Fourier Transform) of the
processed output electrical signal; and
means for computing an effective amplitude and phase
for each spectral component of the frequency band in the
payload to be cancelled.

14. (original) A system as claimed in claim 10,
wherein the means for processing the input electrical
signal comprises:
an amplifier for amplifying the input electrical
signal in accordance with the first output signal
produced by the DSPCU; and
a high order linear band-pass filter for filtering
the frequency band in the payload to be cancelled.

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15. (original) A system as claimed in claim 9, wherein the means for generating the cancellation signal comprises:

a Variable Phase Delay unit for phase matching the input payload signal at the Intensity Modulator and the cancellation signal applied to the Intensity Modulator, using the second output signal produced by the DSPCU and the extracted and processed input signal; and

a driver for applying the cancellation signal to the Intensity Modulator for selectively controlling the intensity of the payload and removing the frequency band to be canceled in the payload.

16. (original) A system as claimed in claim 11, wherein the means for processing the output electrical signal comprises:

an amplifier for amplifying the output electrical signal in accordance with a third output signal produced by the DSPCU;

a high order linear band-pass filter for extracting the frequency band in the payload to be cancelled; and

an Analog to Digital Converter (ADC) for converting the analog signal at the output of said high order linear band-pass filter to digital for the digital processing performed by the DSPCU.